OMB Control No. 2060-0328
Expires 07/31/2011

Annual Report 2007

Transmission Sector

Company Information

Company Name: _____

Gas STAR Contact: _____

Title: _____

Address: _____

_____

City, State, Zip Code: _____

Telephone: _____

Fax: _____

E-mail: _____

Annual Report Summary

- ☐ BMP 1: Directed inspection and maintenance at compressor stations
- ☐ BMP 2: Use of turbines at compressor stations
- ☐ BMP 3: Identify and replace high-bleed pneumatic devices
- ☐ Partner Reported Opportunities (*please specify):*

_____

_____

Period covered by report: From: _____ To: _____

Signature: Date:

- Because the implementation of some technologies reduces emissions for multiple years, Gas STAR allows certain activities to count towards a company's emission reductions beyond the initial year of implementation. Gas STAR designates the maximum length of time that these reductions may accrue as "sunset dates." The Appendix lists these sunset dates. Companies can report the corresponding methane emission reductions each year up to the allowable sunset date. Or, companies may wish to report reductions only once for the implementation year, and have EPA automatically apply the sunset date and count those emissions for the allowable number of years.
- In addition to reporting methane emissions reductions, you are welcome to include other information about your company's participation in Natural Gas STAR in the "Additional Program Accomplishments" section of this form. The Natural Gas STAR Program will use any information entered in this section to recognize the efforts and accomplishments of outstanding partners.

NaturalGas
EPA POLLUTION PREVENTER

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BMP 1: Directed inspection and maintenance at compressor stations

Current Year Activities

A. Facility/location identifier information:
(Note: Please use a separate page for each facility surveyed) _____

B. Leak summary:
Number of surveys conducted at this facility for reporting period _____ surveys

Total number of leaks found: _____ leaks found

Total number of leaks repaired: _____ leaks repaired

C. Cost summary:
Total cost of surveys conducted: $ _____

Total cost of leak repairs: $ _____

D. Methane emissions reduction: _____ Mcf

** BMP 1 must be reported on an annual basis according to actual survey activity.*

Please identify the basis for the emissions reduction estimate, using the space provided to show any calculations

☐ Actual field measurement

☐ Calculation using default

Methane emissions reduction = Average annual leak rate for facility (12,200 Mcf) × Reduction efficiency (70%)

☐ Other *(please specify)*:

For assistance quantifying the methane emission reductions achieved by BMP 1, please refer to the Gas STAR Emission Reduction Quantification Reference Guide, available on the Gas STAR Web site at: epa.gov/gasstar/documents/xls/quantifying_ngs_methane_reductions.xls

E. Total value of gas saved: $ _____

Total value of gas saved = Methane emissions reduction (in Mcf) x Gas value (in $/Mcf) [If not known, use default of $7.00/Mcf]

F. Do you plan to survey this facility/location next year? _____ (Yes/No)

Previous Years' Activities

Use the table below to report any past activities implemented, but <u>not previously reported</u> to the Natural Gas STAR Program

Year	Total Cost of Surveys ($)	Total Cost of Repairs ($)	Estimated Reductions (Mcf/yr)	Value of Gas Saved ($)

<u>BMP 1 Comments:</u> *Please use the back of the page for additional space if needed.*

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BMP 2: Use of turbines at compressor stations

Current Year Activities

A. Facility/location identifier information: _____

B. Turbine summary:
Number of turbines installed: _____ turbines

Total cost of turbine installations (equipment and labor): $ _____

C. Reciprocating summary:
Number of reciprocating engines retired: _____ engines

D. Equipment description: Please provide specifications for turbines installed and/or reciprocating engines retired

	Turbines	*Reciprocating Engines*
Model:		
Horsepower:		
Fuel Consumption:		

E. Methane emissions reduction: _____ Mcf

F. Are these emissions reductions a one-year reduction or a multi-year reduction? ☐ **One-year** ☐ **Multi-year**

If Multi-year:

☐ Partner will report this activity once and let EPA automatically calculate future emission reductions based on sunset date duration (BMP 2 has a sunset period of 20 years).

☐ Partner will report this activity annually up to allowed sunset date.

Please identify the basis for the emissions reduction estimate, using the space provided to show any calculations

☐ Standard Calculation

Methane emissions reduction per turbine installation = [Emissions rate from reciprocating engine per MMcf of fuel used × Fuel consumption for reciprocating engine (in MMcf/hr)]- [Emissions rate from turbine per MMcf of fuel used× Fuel consumption for turbine (in MMcf/hr)]

Please specify your data source:
☐ Field measurement
☐ Manufacturer specifications

☐ Calculation using default

Methane emissions reduction= [0.234 scf/hp/hr × Horsepower of turbine engines installed × Hours turbine engines were used] / 1000

☐ Other *(please specify):*

G. Total value of gas saved: $ _____

Total value of gas saved = Methane emissions reduction (in Mcf) × Gas value (in $/Mcf) [If not known, use default of $7.00/Mcf]

H. Future activity summary:
How many turbines do you plan to install next year? _____ turbines

How many reciprocating engines do you plan to retire next year? _____ engines

Previous Years' Activities

Use the table below to report any past activities implemented, but not previously reported to the Natural Gas STAR Program

Year	# Turbines Installed	Total Cost of Installation ($) (incl. equipment and labor)	# Reciprocating Engines Retired	Estimated Reductions (Mcf/yr)	Value of Gas Saved ($)

BMP 2 Comments: *Please use the back of the page for additional space if needed.*

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BMP 3: Identify and replace high-bleed pneumatic devices

Current Year Activities

A. Facility/location identifier information: _____

B. Facility summary:
Number of devices replaced: _____devices

Percent of system now equipped with low/no-bleed units: _____%

C. Cost summary:
Estimated cost per replacement (including equipment and labor): $ _____ /replacement

D. Methane emissions reduction: _____ Mcf

E. Are these emissions reductions a one-year reduction or a multi-year reduction? ☐ **One-year** ☐ **Multi-year**

If Multi-year:

☐ Partner will report this activity once and let EPA automatically calculate future emission reductions based on sunset date duration (BMP 3 has a sunset period of 7 years).

☐ Partner will report this activity annually up to allowed sunset date.

Please identify the basis for the emissions reduction estimate, using the space provided to show any calculations

☐ Standard calculation

Methane emissions reduction = [Annual emissions from high-bleed devices replaced (in Mcf/yr) - Annual emissions for the replacement devices (in Mcf/yr)] x Number of devices replaced

Please specify your data source:
☐ Field measurement
☐ Manufacturer specifications

☐ Calculation using default

Methane emissions reduction = 124 Mcf/yr x Number of devices replaced

☐ Other (*please specify*):

For assistance quantifying the methane emission reductions achieved by BMP 3, please refer to the Gas STAR Emission Reduction Quantification Reference Guide, available on the Gas STAR Web site at: epa.gov/gasstar/documents/xls/quantifying_ngs_methane_reductions.xls.

F. Total value of gas saved: $ _____

Total value of gas saved = Methane emissions reduction (in Mcf) x Gas value (in $/Mcf) [If not known, use default of $7.00/Mcf]

G. How many high-bleed devices do you plan to replace next year? _____devices

Previous Years' Activities

Use the table below to report any past activities implemented, but not previously reported to the Natural Gas STAR Program

Year	# Devices Replaced	Total Cost of Replacements (incl. equipment and labor) ($)	Estimated Reductions (Mcf/yr)	Value of Gas Saved ($)

BMP 3 Comments: *Please use the back of the page for additional space if needed.*

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Partner Reported Opportunities (PROs)

(For more details on PROs, visit epa.gov/gasstar/tools/recommended.html)

Current Year Activities

A. Facility/location identifier information: _____

B. Activity description: Please provide a separate PRO reporting form for <u>each</u> activity reported. If reporting a DI&M activity, please use a separate page for each location/facility surveyed.

Please specify the technology or practice that was implemented (choose from the list in the appendix or describe your own):	Please describe how your company implemented this activity:
C. Level of Implementation *(check one)*: ☐ Number of units installed: _____units ☐ Frequency of practice: _____times/year	**E. Are emissions reductions a one-year reduction or a multi-year reduction?** ☐ **One-year** ☐ **Multi-year** **If Multi-year:** ☐ Partner will report this activity once and let EPA automatically calculate future emission reductions based on sunset date duration*. ☐ Partner will report this activity annually up to allowed sunset date.
E. Methane emissions reduction: _____ Mcf	**F. Cost summary:** Estimated cost of implementing this practice/activity *(including equipment and labor)*: **$** _____

Please identify the basis for the emissions reduction estimate, using the space provided to show any calculations

☐ Actual field measurement

☐ Other (*please specify):*

☐ Calculation using manufacturer specifications/other source

For assistance quantifying the methane emission reductions achieved by a particular technology or practice, please refer to the Gas STAR Emission Reduction Quantification Reference Guide, available on the Gas STAR Web site at: epa.gov/gasstar/documents/xls/quantifying_ngs_methane_reductions.xls.

G. Total value of gas saved: $ _____ *Total value of gas saved = Methane emissions reduction (in Mcf) x Gas value (in $/Mcf) [If not known, use default of $7.00/Mcf]*	**H. To what extent do you expect to implement this practice next year?**

Previous Years' Activities

Use the table below to report any past implementation of this PRO, but <u>not previously reported</u> to Natural Gas STAR

Year	Frequency of Practice/Activity or # of Installations	Total Cost of Practice/Activity (incl. equipment and labor) ($)	Estimated Reductions (Mcf/yr)	Value of Gas Saved ($)

<u>PRO Comments</u>: *Please use the back of the page for additional space if needed.*

* Because the implementation of some technologies reduces emissions for multiple years, Gas STAR allows certain activities to count towards a company's emission reductions beyond the initial year of implementation. Gas STAR designates the maximum length of time that these reductions may accrue as "sunset dates." The Appendix lists these sunset dates. Companies can report the corresponding methane emission reductions each year up to the allowable sunset date. Or, companies may wish to report reductions only once for the implementation year, and have EPA automatically apply the sunset date and count those emissions for the allowable number of years.

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Additional Program Accomplishments

The Natural Gas STAR Program will use any information entered here to recognize the efforts and achievements of outstanding partners.

Please include any additional information you would like to share about your company's participation in Natural Gas STAR. Examples may include:

- **Activities to strengthen your program (e.g., training/education, innovative technologies or activities, pilot projects, employee incentive programs).**
- **Efforts to communicate your participation and successes (e.g., internal newsletters, press releases, company Web site).**
- **Participation in Natural Gas STAR program activities (e.g., contributions to case studies, presentation at annual workshop).**

Additional Accomplishments:

Additional Accomplishments Comments: *Please use the back of the page for additional space if needed.*

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Appendix

Methane Emission Reduction Technologies & Practices— Transmission Sector

The list below describes a variety of methane emission reduction technologies that Natural Gas STAR partners in the transmission sector have implemented and reported to Natural Gas STAR. You may use this list as a guide when completing your annual report. Sunset dates (i.e. the length of time a technology or practice can continue to accrue emission reductions after implemented) are one year in duration unless otherwise noted in parentheses. An asterisk (*) indicates that a technical document related to the technology or practice is available online at epa.gov/gasstar/tools/recommended.html.

Compressors/Engines

- Automate systems operation to reduce venting*
- Automated air/fuel ratio controls (10 years)*
- Eliminate unnecessary equipment and/or systems*
- Install electric compressors (10 years)*
- Install electric motors (10 years)
- Install electric starters (10 years)*
- Lower purge pressure for shutdown*
- Redesign blowdown systems and alter ESD practices*
- Reduce the frequency of engine starts with gas*
- Reducing emissions when taking compressors off-line*
- Reducing methane emissions from compressor rod packing systems*
- Replace compressor cylinder unloaders*
- Replace gas starters with air (10 years)*
- Replace ignition - reduce false starts*
- Replacing wet seals with dry seals in centrifugal compressors (10 years)*

Dehydrators

- Install condensers on glycol dehydrators (10 years)
- Optimize glycol circulation and install of flash tank separators in dehydrators*
- Replace glycol dehydrator with separators & in-line heaters (10 years)*
- Replacing gas-assisted glycol pumps with electric pumps (10 years)*
- Reroute glycol skimmer gas*

Directed Inspection and Maintenance

- Conduct DI&M at remote sites*
- DI&M: aerial leak detection using laser and/or infrared technology
- DI&M: leak detection using IR camera/optical imaging
- DI&M: survey and repair leaks
- Inspect and repair compressor station blowdown valves*
- Use ultrasound to identify leaks*

Pipelines

- Composite wrap for non-leaking pipeline defects*
- Inject blowdown gas into low pressure mains*
- Perform leak repair during pipeline replacement*
- Pipeline replacement and repair
- Recover gas from pipeline pigging operations*
- Use inert gases and pigs to perform pipeline purges*
- Using hot taps for in-service pipeline connections*
- Using pipeline pumpdown techniques to lower gas line pressure before maintenance*

Pneumatics/Controls

- Convert gas pneumatic controls to instrument air (10 years)*
- Convert gas-driven chemical pumps to instrument air (10 years)*
- Reduce meter run blowdowns
- Replace bi-directional orifice metering with ultrasonic meters*

Tanks

- Capture methane released from pipeline liquid storage tanks (10 years)*
- Install flash gas compressors (10 years)

Valves

- Close main and unit valves prior to blowdown*
- Design isolation valves to minimize gas blowdown volumes (10 years)*
- Move fire gates in to reduce venting at compressor stations (10 years)*
- Test and repair pressure safety valves*
- Use of YALE closures for ESD testing*

Wells

- Switch from underbalanced to overbalanced drilling in gas storage field

Other

- Improve system design/operation
- Install flares (10 years)*
- Require improvements in quality of gas received*